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DEVELOPMENT OF COMPUTING FOR STATISTICAL PURPOSES

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STATISTICAL COMPUTING PROJECT

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STATISTICAL COMPUTING PROJECT

European regional project for use of computers for statistical purposes and the design and development of statistical information systems.

I. THE PROJECT APPROACH

In recent years the national statistical offices of ECE member countries have been engaged in an exchange of experiences in the use of computers and the design and development of statistical information systems. At the suggestion of ECE and some European countries, UNDP agreed to assist in undertaking a regional project on the use of computers for statistical purposes and the design and development of automated statistical information systems. The Statistical Computing Project (SCP) was established in 1980.

The following countries are participating in the Project: Bulgaria, Canada, Czechoslovakia, Denmark, Finland, France, German Democratic Republic, Greece, Hungary, Ireland, Italy, Netherlands, Poland, Romania, Spain, Sweden, Turkey, United Kingdom and Yugoslavia.

The Project has been carried out jointly by the statistical offices, or equivalent institutes, of the participating Governments, UNDP and the ECE as the Executing Agency.

II. OBJECTIVES OF THE PROJECT

The programme is aimed at increasing the efficiency of national statistical offices with a better use of computers, in order that policy-makers and planners have more accurate and more up-to-date data. With a division of labour in programming and in the development of software products between national statistical offices, the skill and experience of highly developed countries will be transferred to countries with less-developed computerization of statistical services.

The immediate objectives of the Project are to establish a programme on the use of computers for statistical purposes and the design and development of appropriate software and methods for statistical information systems. Tasks include the organization of joint work between national statistical offices of participating countries on the design of software products for everyday work, including applied research, development and testing of software products and related tools specially designed for use in practical statistical work.

III. SUMMARY OF ACTIVITIES

Four Joint Groups have been established to work on the following matters: (a) data editing; (b) table generation; (c) statistical data base management; and (d) meta-information system. Activities and outputs are summarized in Annex I.

Data editing specifically is of paramount importance as regards consistency and quality of the output produced in statistical offices. It generally occupies a substantial volume of staff and at the same time has a heavy impact on the problem of speeding up statistical production work in order to improve the timeliness of putting socio-economic information at the disposal of planners and policy makers. The AERO generalized data editing software is the main result of the joint work.

Data base management technology presently is one of the major research development areas in the field of data processing. For national statistical offices, this issue particularly is of eminent future importance in view of their large and ever-increasing data stocks and the flexibility that is expected by policy makers as regards ad hoc evaluation of these data. Enhancement of the RAPID data base management system with additional new software modules is the significant result from this work area. The Base Operator software system is the recent output of this Joint Group.

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The impact of table generation technology on the efficiency of national statistical offices is an issue of general importance in the field of statistical data processing. Efficient table generation software affects very much the overall performance providing a tool for producing complex statistical tables that are requested by statisticians and policy makers. Two new tabulations packages have been produced: INTERTAB and TAU.

The applied research on metainformation system focuses on a country's statistical information system as a whole. Given the increasing number and volume of data stocks and the growing extent of processing socio-economic information the need of developing integrating views and methods is generally felt, and a specific task force is devoted to that area. A guidebook for metainformation users and designers will summarize the findings of the experts in this connexion.

In addition to the six sessions of the Steering Committee and seven meetings of the lead countries (together with the Bureau of the Steering Committee), the four Joint Groups held 41 meetings during 1981-1984. The Joint Groups established expert groups and assigned specific sub-tasks to them. In this connection, experts met at 33 planned and ad hoc meetings during 1981-1984. More than 500 working papers, drafts and other documents were prepared for these meetings for consideration and discussion by participating countries, Joint Groups and the Steering Committee. The SCP countries organized and hosted most of the meetings.

A. Table Generation

The Joint Group on Table Generation set up the following work programme:

- evaluation of existing table generator packages;
- formulation of recommendations as regards the suitability of existing software for statistical offices;
- specification of the requirements for the functional characteristics of table generators;
- definition of a programme for developing and producing the appropriate software to that specification;

The impact of table generation technology on the efficiency of statistical production does not need to be particularly emphasized. Therefore efficient table generation calls for improved software which should, in particular, concern the variety of data description, adequate file management, user interface via processing language and a wide scope of internal processing aspects effecting the overall performance. The Joint Group concluded these objectives in the specification and development of a new table generating system, called INTERTAB.

In 1981, a draft profile of functional characteristics of a table generator was set up and later the Joint Group developed the main functional specification and structural concept of an "ideal" tabulation system.

In parallel, the Group scrutinized table generator packages widely used in statistical offices with a view to possible modification to fulfil the requirements that have been defined by the Group. However, no existing system was esteemed a serious candidate for such modification. The TAU system, having been developed by the Office of Population Census and Surveys (United Kingdom) which later came to the knowledge of the Joint Group, was particularly evaluated from this aspect.

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As regards the general evaluation task of tabulation packages, the Group agreed on a check-list which had been used for a preliminary report and a description of three selected packages. This report was reviewed and a final report of feature analysis and evaluation of five selected tabulation packages was completed in 1984.

After having discussed the specifications of main characteristics and functional requirements considered important for a tabulation system, the Joint Group realized that this could be covered only with a completely new software system, called INTERTAB. Though the development and implementation of a completely new table generator package had been considered unrealistic at the outset, the Joint Group felt that the implementation of INTERTAB might be feasible within the lifetime of the Project. In October 1981, at its second meeting, the Steering Committee agreed that the Joint Group would develop a new software system such as INTERTAB.

It should be mentioned that the parallel design of modules and later their coding and joint testing called for a high standard and precise interfacing in the implementation work, and demanded close co-ordination among the five implementation centres. The chairmen of the Joint Group and the expert group co-ordinated most of the practical work on implementation which was promoted by the Project Co-ordinator and the Technical Adviser.

Even though delays were encountered in several sub-tasks, the overall plan of the development was nearly implemented within the timetable agreed, in particular, the milestone activities were completed very close to the original scheduled dates. By the end of 1984, coding of INTERTAB Version 1 was completed and after several joint testing sessions the software system was nearly completed and thoroughly tested. It is envisaged that after the final test in May 1985, the distribution tape of INTERTAB Version 1 will be compiled by the third quarter of 1985 together with revised full documentation of the system.

In 1984, the Joint Group produced basic documentation on INTERTAB in five volumes of manuals; test data for the software system acceptance test was also prepared. The Group drafted proposals for future maintenance of INTERTAB which will be undertaken with the shared responsibility of the implementation centres of Czechoslovakia, Denmark and the German Democratic Republic.

The Office of Population Census and Surveys (OPCS, United Kingdom) co-operated with the statistical offices of Poland and Romania in the implementation and testing of TAU in the respective countries. Poland carried out full implementation of TAU developed by OPCS for ICL computers. The implementation of TAU is in progress in Romania. In April 1983, a one-week user course was held in London, arranged by the OPCS, for experts from Poland and Romania.

B. Data Editing

In the field of data editing, the Joint Group agreed on the following main tasks:

- evaluation of data editing methods actually applied in national statistical offices;
- development of data editing systems both for qualitative and quantitative data;
- improvements of the AERO package, the selected data editing system and elaboration of the full documentation.

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Data editing occupies a substantial volume of staff and, at the same time, has a heavy impact on the problem of speeding up statistical production work in order to improve the timeliness of putting socio-economic information at the disposal of planners and policy makers. Data editing specifically is of importance as regards consistency and quality of the output produced in statistical offices. This is why the field of data editing holds a somewhat special position within the area of statistical data processing, and the Steering Committee gave high priority to this work area.

At the outset of the Project the Joint Group agreed to specify a new version of the AERO generalized data editing system developed by Hungary. After having collected comments and recommendations from countries, AERO Version 2 was developed in 1981 and made available, together with the documentation. Countries who implemented AERO for selected applications reported on their experience, which also complemented the improvement of the new AERO versions. The Group later recognized a need for a version of AERO using PL/I(F) compiler, and this new version of AERO was available in mid-1984. Interactive features were implemented in AERO Version 2.5 in 1984. A modification of this version with a better programming technique was agreed upon (AERO V.2.6). Hungary and Yugoslavia planned to complete this development by mid-1985. The updated documentation on AERO, including the interactive facilities, is now available.

In parallel with the enhancement of the AERO software system, a new data editing system had been developed in Spain, called DIA, showing different design characteristics compared with AERO. This system became operational in 1984 and its feature analysis will be added later to the existing paper on evaluation of data editing systems.

A comparative analysis of existing generalized data editing packages was agreed on with the aim of providing an aid for selecting appropriate packages for a given application. A final paper on feature analysis and evaluation of five selected generalized data editing systems was completed and published in 1984.

A methodological document on the data quality problems in connection with editing statistical data was prepared and discussed at several meetings. The Joint Group agreed that the data quality problems may be one of the key issues in connection with editing statistical data, and this problem should be exposed accordingly in the overall design of the editing process. A final paper on the data quality problems was prepared.

After having recognized that data editing has a key function in the processing of surveys, in 1981 the Joint Group proposed to enlarge its work towards generalized survey processing systems (GSPS). The Steering Committee endorsed this additional objective of the Group. The basic functions, features and the content of Generalized Survey Processing Systems were outlined. Numerous working papers were prepared towards the design and implementation of GSPS, in which existing software systems were tabled and considered as potential elements of GSPS. The United Kingdom co-ordinated this work and finalized a paper on "Design and implementation of generalized survey processing systems". In 1985, a new Joint Group on GSPS was established.

As the first available software product of the SCP, the AERO system was widely distributed to the SCP countries and outside the SCP. Mention should be made that the AERO software system was sent to the Statistical Institute for Asia and the Pacific (SIAP, Tokyo) and it was installed on their computer system. The AERO system is now offered by SIAP for distribution to statistical offices within the ESCAP region with a modest support and training through SIAP computer centre. This arrangement was the first step for promoting practical transfer of the SCP output outside the ECE region, in particular to developing countries.

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C. Relational data base management - RAPID

The countries of the Joint Group on statistical data base management agreed that they will concentrate on the RAPID relational data base management system, developed and maintained by Statistics Canada. They outlined the following work programme:

- further development of RAPID software system;
- maintenance and support to existing and new implementations of RAPID in participating statistical offices;
- development of interfaces to existing systems and applications that serve main functions and operations of statistical work;
- preparation of additional documentation as an introduction to RAPID and to relational DBMS.

The data base management technology is, presently, one of the major issues in statistical offices. It is of particular importance in view of the very large and ever-increasing data stocks and the flexibility that is expected by users as regards ad hoc evaluation and processing of these data. It was recognized that RAPID is being used in statistical offices and further support should be provided for promoting new implementations of RAPID within statistical organizations.

The Joint Group on RAPID started to implement its programme immediately after the first meeting of the Steering Committee in December 1980. The RAPID system has been made available to participating countries by Statistics Canada. The Group defined the major tasks for the Project with the aim of establishing an efficient user group of statistical offices, in which Canada, the German Democratic Republic, Hungary and Sweden started to closely co-operate on further development of RAPID. They also agreed that promoting new installations of RAPID within participating statistical offices should have special importance for broadening the application of existing software.

In 1981, the RAPID software was installed in Hungary and the census application was later added to this installation in 1982-1983. Consultants from Canada and Sweden supported to a large extent this complex installation. New RAPID installations have been carried out in the German Democratic Republic in 1982-1983 and in Yugoslavia in 1983, with the help of consultants from Statistics Canada and Statistics Sweden. The installation in Berlin aimed at a pilot application on international statistics. In Belgrade, the pilot application of retail and consumer price statistics will be in operation in 1985 after the full installation of the new hardware scheduled for January 1985.

The installation of RAPID in the German Democratic Republic was aimed at making RAPID available on other IBM-compatible mainframes. The practical transfer of RAPID onto EC mainframe computers was successfully completed in Berlin.

In 1982, the Joint Group studied the forms and ways of developing interfaces between application programs and RAPID software. As the result of this study, the concept of the base operator system was defined and a new co-operative approach to the development of a set of RAPID-related software pieces was agreed. This new software system would support typical, elementary operations on RAPID files or conventional flat files, and it could be an easy tool for combining these elementary operations with applications of RAPID data

base used for producing requested statistical output. At present, six base operators have already been developed within the frame of the new RAPID-related software. The base operator system will be available together with the documentation .

D. Metainformation system - METIS

The joint Group on Metainformation System decided on the following work programme:

- review and evaluation of formalized methods and rules for describing statistical data;
- review of experience acquired by statistical offices in the use of description of data in catalogues and registers;
- specification of general data model as a basis for the development of metainformation system (later called METIS);
- logical specification of metainformation system.

The issue of METIS focuses on a general data model to be used in designing a metainformation system in connection with the statistical information system as a whole. Given the increasing volume of statistical data, the growing interrelationship among statistical surveys and the growing extent of processing socio-economic information, in particular, in response to non-statistician users, the need to develop integrating views and methods was generally felt, since successful work in this direction would naturally augment the efficiency of the statistical information system. It therefore appeared well justified that the specific Joint Group to this area had been established although, no doubt, it constitutes one of the most complex fields of research. This was well reflected in the joint work carried out by four countries actively participating in the implementation of the work programme for the Joint Group.

In 1984, the Joint Group concentrated on the preparation of the User Guide to the Metainformation Systems in Statistical Offices, which was completed and published in November 1984. This document is aimed at providing a rather precise specification of the methodology aiding statisticians on how to use metainformation, data on statistical data, in the environment of statistical information systems. The system of data contents and the retrieval of these data are explained in detail in the User Guide. As the Joint Group did not devote substantial time to the question of development of relating software elements, this document gives only a general reference to this matter without any attempt being made towards reviewing software elements and methods available and used for sub-tasks or coverage of METIS. The selected chapters for designing METIS have been revised and this document will be published in 1985

E. Other Activities

The Steering Committee considered forms and ways of disseminating information on the work carried out within the framework of the Project. It approved the publication of an Information Newsletter at regular intervals, in addition to reports on planned meetings of various SCP bodies. In September 1983, a scientific meeting on "Computer software for national statistical offices" was organized at the forty-fourth session of the ISI in Madrid. This meeting aimed at bringing some of the outputs of the SCP to the attention of the representatives from developing countries present at the ISI meeting.

At its first meeting in Geneva, the Steering Committee considered that a Handbook on statistical data processing methodology should be compiled in harmony with the general objectives of the Project. The preliminary draft paper for this work was prepared, commented on and updated in 1982. On the basis of the available drafts and collected comments two experts, one from Sweden and one from the United Kingdom, were engaged for the finalization and editorial work on the Handbook. In November 1983, the Handbook was published and distributed to European statistical offices and also to the statistical offices of developing countries, outside Europe, who expressed their appreciation particularly in respect of the usefulness of the Handbook for the statistical services of the EDP centres in the respective regions and countries.

The Steering Committee also agreed that there is a need for the standardization of the terminology used in statistical computing, and that the preparation of a specialized glossary was of primary importance. Chapters of the Glossary of Terms used in connection with the the joint work of the Project were drafted in 1982 and circulated to experts of the Joint Groups for comments and updating. The final version of the Glossary was completed and published in November 1984.

The Committee recommended that a Workshop on the SCP, which was held in Budapest in November 1984, might be useful for disseminating information on the results of the SCP, in particular to developing countries. The purpose of the Workshop was to provide information on the SCP to experts of statistical offices from different aspects, to bring an overall presentation on the Project, in particular on methods and software developed within its framework, and to review the results of the international co-operation in the work area of statistical computing. The large number of participants (53 from 26 countries and 16 Hungarian experts) who attended the Workshop demonstrated in a concrete way that participating statistical offices were keenly interested in the work carried out during the lifetime of the Project.

IV. DISSEMINATION OF SCP KNOW-HOW AND PRODUCTS

In harmony with the decision of the Steering Committee that the products developed within the Project should be made available to developing countries, substantial efforts have been devoted to the transfer of the SCP output and know-how to those countries. Co-operation with other United Nations Regional Offices was established in order to keep developing countries informed about the SCP products available, and to define ways of co-operating in the transfer of the SCP know-how. At the request of the Economic Commission for Latin America and the Caribbean (ECLAC), documentation on INTERTAB and TAU has been provided. The program tape of AERO and the documentation has been sent to ECLAC, Santiago, and to ESCAP, Bangkok. The AERO system was successfully installed in SIAP, Tokyo.

Direct consultations took place in Bangkok (1983) and Addis Ababa (1984) with staff members of ESCAP and ECA on the issue of the practical transfer of SCP software packages and know-how to those regions. An information note on the SCP was also sent to Bangkok and Addis Ababa. In response to the information given on the SCP activities and results, several developing countries have indicated strong interest in the Project and have requested various documents and software descriptions.

It should be mentioned that a number of countries not participating in the SCP have also contributed, to some extent, to the SCP. The Joint Group on Data Editing received valuable information and documentation from the statistical offices of Austria, Australia, the Federal Republic of Germany,

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and from the United States Bureau of the Census. The Joint Group on Table Generation has likewise received valuable and useful documentation from the Australian Bureau of Statistics and from the United States Bureau of the Census.

V. THE FUTURE OF THE PROJECT

The future of the Project after 1984 was first discussed at the fourth meeting (special session) of the Steering Committee in Geneva (March 1983) in connection with the evaluation of the SCP. At its fifth meeting in Belgrade (November 1983), based on the common opinion of participating countries that the SCP was beneficial to the statistical offices participating in the Project, the Steering Committee agreed on the need for the continuation of international co-operation in the field of software development. In the light of the envisaged results of software systems developments and of their implementation in the participating statistical offices, the Committee stressed that the main field of future co-operation should be defined and embodied in the programme of work of the Conference of European Statisticians (CES).

As it was agreed that international co-operation in the field of software development will continue under the auspices of the CES, the Joint Groups set up their respective programmes of work for 1985-1986. This called for a study of the overall results achieved by the SCP on the one hand towards their multiple utilization for statistical offices and, on the other, for the full implementation of the SCP results and methods.

Considering the final outputs of the SCP, there were products ready for use while there were tasks either which were not completed by the end of 1984 or need further development towards new versions of developed software systems. All these items have been mentioned in this report and the summary of them is given in the Annex. The final outputs of the SCP will provide a solid basis for the departure of a new phase of international co-operation in the selected work areas of statistical computing.

Regarding the organization of work for the phase after 1984, it is now agreed to retain the organizational form of the Joint Groups for selected subject areas in which statistical offices of the ECE countries interested in the co-operative effort will continue to participate or join by 1985. Proposals for four subject areas were prepared, together with the preliminary programme of work for 1985 and onwards, which have now been incorporated in the work programme of the CES. The Joint Groups will implement the work programme and co-ordinate their work in a similar way to that followed when they carried out the joint work during the lifetime of the SCP.

In recent years, the Steering Committee adopted regularly the programme of work for the coming years, and guided the joint work of the Project on that basis. In this respect, the Joint Groups in collaborating with the Project Co-ordinator prepared and submitted proposals to the Committee for consideration. As regards the work plans of the Joint Groups for 1985 and onwards, the Groups drafted their respective programme of work for this period. These were discussed by the Steering Committee in Bratislava (December 1984) and later by the meeting of the Task Force in Geneva (February, 1985), which is composed of the lead countries of the Joint Groups. The Task Force revised and prepared a programme of work for 1985/1986, which will then be submitted to the thirty-third plenary session of the CES for adoption. This procedure would provide a smooth transitional period for the Joint Groups regarding their respective work plans to be implemented.

Annex I

Final output of the Project

During the period of 1981-1984, numerous activities have been carried out and the outputs of the Project produced are summarized in this annex. Reference is given to outputs produced either in generally available form for applications like software systems and study paper on related software and methodology or in results of individual applications of particular software systems in national statistical offices. It should be mentioned that these results have been utilized towards the realization of the related development objectives, both in terms of Project's objectives and in development objectives of individual statistical offices participating in the joint co-operative effort.

/Annex I (continued)

Annex I (continued)

Completion date

Activities

Output

A. Joint Group on RAPID

- | | | |
|--|--|---------|
| 1. Transfer of RAPID software system to new installation site from Canada. | Installation of RAPID in Hungary | 4Q/1981 |
| | Installation of RAPID in the German Dem. Rep. | 4Q/1981 |
| | Installation of RAPID in Italy | 1Q/1983 |
| | Installation of RAPID in Yugoslavia | 4Q/1983 |
| 2. Implementation of RAPID software system on IBM-compatible mainframes. | Implementation of RAPID on EC 1055 hardware system | 1Q/1984 |
| | Implementation of RAPID on EC 1044 hardware system | 1Q/1984 |
| | Documentation of EC version of RAPID software | 3Q/1984 |
| 3. New data base applications of RAPID software systems. | Population census (2%) applications (in Hungary) | 4Q/1983 |
| | International Statistics (in German Dem. Rep.) | 2Q/1983 |
| | Retail and consumer price statistics (in Yugoslavia) | 3Q/1984 |
| 4. Development of base Operator system (new software elements for RAPID software). | Design and implementation of set of base operators | 3Q/1984 |
| | Documentation of Base Operator system | 4Q/1984 |
| 5. Completion of documentation on RAPID software system. | RAPID Guidelines | 1Q/1984 |

B. Joint Group on Data Editing

- | | | |
|---|---|---------|
| 1. Transfer of AERO software system to new installation | Installation of AERO in Yugoslavia | 1Q/1981 |
| | Installation of AERO in Spain | 1Q/1981 |
| | Installation of AERO in SIAP (Tokyo) (AERO Version 2.0) | 4Q/1983 |

Annex I (continued)

Activities	Output	Completion date
2. Further development of AERO software system	Release of AERO Version 2.0 Documentation on AERO Version 2.0 Conversion of AERO Version 2.0 into PL/I(F) compiler Release of AERO Version 2.5 Machine-readable documentation on AERO Version 2.5 Release of AERO Version 2.6	4Q/1981 2Q/1982 2Q/1984 4Q/1983 4Q/1984 1Q/1985
3. Comparative analyses of selected data editing systems	Paper on the feature analyses	3Q/1984
4. Development of DIA data editing system in Spain	Release of DIA Version 1.0	3Q/1984
5. Study of data quality problem	Paper on data editing and its effect on quality of data	4Q/1983
6. Design of generalized survey processing system (GSPS)	Evaluation of GSPS needs and requirements Specification on design and implementation of GSPS	3Q/1983 1Q/1985
<u>C. Joint Group on Meta-information System</u>		
1. Development of meta-information system (METIS)	Conceptual description of METIS Functional specification of METIS Draft manual for METIS users	2Q/1981 2Q/1982 2Q/1984
2. Compilation of documentation on METIS	Users Guide to Meta-information System in Statistical Offices Selected chapters for designers of METIS	4Q/1984 1Q/1985
3. Implementation of METIS	Pilot implementation of METIS in Czechoslovakia Pilot implementation of METIS in Poland	1Q/1984 2Q/1984

Annex I (continued)

Completion date

Output

Activities

D. Joint Group on Table Generation

- | | | |
|---|---|--|
| 1. Development of new tabulation system, INTERTAB | System specification of INTERTAB
Detailed design of INTERTAB
Coding and testing INTERTAB Version 1
Three volumes of system documentation | 4Q/1982
4Q/1983
2Q/1985
4Q/1984 |
| 2. Comparative analyses of selected tabulation systems | Paper on the feature analyses | 4Q/1984 |
| 3. Development of TAU tabulation system in the United Kingdom | Implementation of TAU Release 3
Implementation of TAU Release 4
Implementation of TAU Release 5 | 2Q/1983
1Q/1984
3Q/1984 |
| 4. Transfer of TAU software system to new installation site from the United Kingdom | Installation of TAU Release 3 in Poland
Evaluation of TAU Release 3 in Romania | 4Q/1983
4Q/1983 |

E. Others

- | | | |
|--|---|---------------------|
| 1. Disseminating information on the work and products of the Project | Organizing and arrangement of a scientific meeting on the SCP products at the forty-fourth session of the International Statistical Institute in Madrid | 16 September 1983 |
| | Organizing and arrangement of a Workshop on the SCP in Budapest | 12-17 November 1984 |
| | Publication of a booklet on the SCP products (Reading across the regions with the SCP) | February 1985 |
| 2. Compilation of a Handbook on Statistical Processing Methodology | Publication of the Handbook | 4Q/1983 |
| 3. Compilation of a glossary of Terms on the SCP | Publication of the Glossary | 4Q/1984 |

ANNEX II

Project budget and its revisions (in US\$)

Status of revision	TOTAL	1979	1980	1981	1982	1983	1984	1985
Original budget (see Project document) September 1980	915 000	19 000	203 350	249 000	265 500	178 650	-	-
Revised budget RER/78/008/G February 1981	865 643	20 606	14 837	296 200	302 400	231 600	-	-
Revised budget RER/78/008/I April 1982	880 263	20 606	17 775	157 304	249 620	227 000	207 958	-
Revised budget RER/78/008/J April 1983	893 022	20 606	17 775	157 304	208 822	239 759	248 756	-
Revised budget RER/78/008/K March 1984	919 602	20 606	17 775	157 304	208 822	209 360	303 735	-
Revised budget RER/78/008/L March 1985	949 602	20 606	17 775	157 304	208 822	209 360	227 126	108 609

Annex III

Governments' Contribution in Kind to the Project (1981 - 1984)

(1981 - 1984)

	1980		1981		1982		1983		1984		Total	
	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual
System analyst (no) 1/	-	-	-	44	-	52	-	53	-	61	-	-2/
Man-months	140	-	250	154	250	202	250	238	-	313	740 2/	907
Programmer (no) 1/	-	-	-	9	-	17	-	16	-	16	-	-2/
Man-months	-	-	-	23.5	-	88	-	63.5	-	103	-	278
Consultant	-	-	-	2	-	3	-	5	-	7	-	-2/
Man-months	-	-	4	2.5	4	3	4	3.5	-	4	12	13
Mission costs of delegates (in US\$ equivalent)	15,000	-	20,000	47,500	20,000	67,970	19,000	79,100	-	100,550	74,000	295,170
Hosting costs of meetings (in US\$ equivalent)	10,000	-	15,000	18,300	15,000	17,390	10,000	9,210	-	11,500	50,000	56,800
Computer time (in US\$ equivalent)	150,000	-	250,000	59,000	250,000	154,000	195,000	188,000	-	454,000	845,000	895,000

Notes:

1/ Contribution of system analysts and programmers were planned together but reported individually by countries.

2/ Since experts can, in most cases, be the same from one year to the other, no cumulative total is drawn up.

3/ The figure of 740 should be compared with 1185.

Data were available from reports of national statistical offices participating in the Project.